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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/978,184	10/17/2001	Ronald E. Laird	3691-308	3917

7590 12/17/2002

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EXAMINER

PIZIALI, ANDREW T

ART UNIT	PAPER NUMBER
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1775

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DATE MAILED: 12/17/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/978,184

Applicant(s)

LAIRD, RONALD E.

Examiner

Andrew T Piziali

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-- The MAILING DATE of this communication appears on the cover sheet with the corresponding address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 05 November 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-40 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 2,4,5,11-14 and 23 is/are allowed.
- 6) ☒ Claim(s) 1,3,6-10,15-22 and 24-40 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 9.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claims 1, 3, 6, 9, 24, 27-32, 34 and 39 are rejected under 35 U.S.C. 112, first paragraph, as based on a disclosure which is not enabling. The solar control article being an IG unit is critical or essential to the practice of the invention, but not included in the claims is not enabled by the disclosure. See *In re Mayhew*, 527 F.2d 1229, 188 USPQ 356 (CCPA 1976). The specification discloses only IG units (Table 2) having a sheet resistance of no greater than 5.0 or 3.5 ohms/square.

3. Claims 9, 15-20, 24-26 and 39 are rejected under 35 U.S.C. 112, first paragraph, as based on a disclosure which is not enabling. The complete coating configuration, including all antireflective layers, upper and lower buffer layers, infrared reflective layers and overcoat layer, is critical or essential to obtaining the claimed properties, but not included in claims is not enabled by the disclosure. See *In re Mayhew*, 527 F.2d 1229, 188 USPQ 356 (CCPA 1976).

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 17-18 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The applicant is required to set forth specific compositions for the coating layers. Claims merely setting forth physical characteristics desired in article, and not setting forth

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specific compositions which would meet such characteristics, are invalid as vague, indefinite, and functional since they cover any conceivable combination of ingredients either presently existing or which might be discovered in future and which would impart desired characteristics.

Ex parte SLOB, 157 USPQ 172.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 7, 9, 15-16, 21, 24, 27-28, 30, 35, 37 and 39 are rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent No. 6,060,178 to Krisko in view of US Patent 5,935,702 to Macquart et al. (hereinafter referred to as Macquart).

Regarding claims 7, 9, 15-16, 21, 24, 27-28, 30, 35, 37 and 39 Krisko discloses a coated article comprising a substrate (12), and a coating supported by the substrate comprising an antireflection layer of silicon nitride (60), a layer of silver (42), an antireflection layer of silicon nitride (64), a layer of silver (44), and a layer of silicon nitride (62) (column 7, lines 16-34 and Figure 3). Krisko discloses the use of a zinc oxide layer below each silver layer and a protective barrier niobium layer above each silver layer (column 7, lines 16-34 and Figure 3).

Krisko fails to mention substituting a nickel oxide or chromium oxide layer for each niobium layer, but Macquart discloses the use of either a niobium layer, a nickel layer, or a chromium layer over a silver layer to protect the silver layer (column 6, lines 8-16). Macquart

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further discloses that the nickel or chromium layer is oxidized by sputtering of the above zinc oxide layer in the presence of oxygen (column 6, lines 20-21). It would have been obvious to one having ordinary skill in the art at the time the invention was made to substitute a nickel or chromium layer for the niobium layers of Krisko, as disclosed by Macquart, because nickel or chromium layers are functionally equivalent to niobium layers as sacrificial layers meant to protect the silver layers.

Krisko discloses that the silicon nitride layers (16 and 24) serve as antireflection layers (column 5, lines 31-38). Krisko fails to specifically mention substituting titanium oxide or tin oxide for the antireflection layers of silicon nitride, but the examiner takes Official Notice that silicon nitride, titanium oxide, and tin oxide are all well known in the art as high refractive index materials. It would have been obvious to one having ordinary skill in the art at the time the invention was made to make the antireflection layers of Krisko (60,62, and 64) from any suitable high refractive index material, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of design choice.

Considering the substantially identical coated article of the cited prior art compared to the applicants' coated article, in terms of composition of the layers, layer thicknesses and method of making the layers, it appears that the coated article would possess all the material properties claimed by the applicant. This reasoning holds for all subsequent rejections.

Regarding claim 35, Krisko discloses that the layers may be deposited by sputtering (column 4, lines 14-18).

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8. Claims 10, 17-19, 25-26, 33 and 40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Krisko in view of Macquart as applied to claims 7, 9, 15-16, 21, 24, 27-28, 30, 35, 37 and 39 above, and further in view of US Patent No. 5,800,933 to Hartig et al. (hereinafter referred to as Hartig '933).

Regarding claims 10, 17-19, 25-26, 33 and 40, Krisko discloses that the coated article may be used in automobiles or as architectural glass, but fails to specifically mention using the article as an IG window unit. Hartig '933 discloses that it is known in the art to use a solar control coated glass article in IG window units to provide insulating properties (column 1, lines 21-58). It would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate the coated article of Krisko into an IG window unit, because the unit provides insulating properties desirable in many architectural applications.

9. Claims 8, 22, 32 and 38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Krisko in view of Macquart as applied to claims 7, 9, 15-16, 21, 24, 27-28, 30, 35, 37 and 39 above, and further in view of US Patent No. 6,398,925 to Arbab et al. (hereinafter referred to as Arbab).

Regarding claims 8, 22, 32 and 38, Krisko discloses that besides a zinc oxide film other oxide films may be utilized (column 7, lines 46-55), but fails to specifically mention doping at least one zinc oxide layer with aluminum. Arbab discloses that either zinc oxide or aluminum doped zinc oxide may be used above a silver layer to protect the silver layer and improve adhesion (column 5, lines 22-33, column 6, lines 18-37 and lines 42-68). It would have been obvious to one having ordinary skill in the art at the time the invention was made to make any of the zinc oxide layers of Krisko from any suitable material capable of protecting the silver layers

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and improving adhesion between layers, such as aluminum doped zinc oxide, as disclosed by Arbab, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of design choice.

10. Claims 34 and 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Krisko in view of Macquart as applied to claims 7, 9, 15-16, 21, 24, 27-28, 30, 35, 37 and 39 above, and further in view of US Patent No. 6,277,480 to Veerasamy et al. (hereinafter referred to as Veerasamy).

Regarding claims 34 and 36, Krisko does not mention providing a final coat of DLC on the coated article, but Veerasamy discloses that it is known to coat vehicle windows/windshields or architectural glass with DLC to provide scratch resistance and improve durability. It would have been obvious to one having ordinary skill in the art at the time the invention was made to coat the article of Krisko with a DLC layer, because it would provide scratch resistance and improve durability.

Regarding claim 36, Veerasamy discloses that the DLC layer may be deposited by an ion beam deposition method (paragraph bridging columns 6 and 7).

Allowable Subject Matter

11. Claims 2, 4, 5, 11-14 and 23 are allowed.

12. The following is a statement of reasons for the indication of allowable subject matter:

The closest prior art is Krisko in view of Macquart or Hartig, but none of the references teach the advantages associated with sandwiching an infrared reflective silver layer between an upper layer of NiCrOx and a lower layer of ZnOx, ZnAlOx or the like. The current applicants have found, unexpectedly, that the specific combination of layers achieves a combination of high

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visible transmission and reduced sheet resistance as well as acceptable durability (mechanical/chemical).

Response to Arguments

13. Applicant's arguments with respect to the claims have been considered but are moot in view of the new grounds of rejection.

Counsel asserts that Krisko teaches "that the layer (i.e., the Nb layer) overlying each Ag layer must be metallic (i.e., not oxidized) in order to prevent nitrogen and oxygen from coming into reactive contact with the Ag during tempering." The examiner respectfully disagrees. Krisko discloses that a niobium layer is "capable of chemically reacting with and thus capturing nitrogen and oxygen to form nitrides and oxides of niobium and thus prevent reaction with the silver reflective film at high temperatures" (paragraph bridging columns 4 and 5). Krisko discloses (in the following sentence) that a zinc oxide film is also capable of performing the same duty as long as it is sufficiently thin (from 25 to 250Å) as not to be a significant source of oxygen. Regardless, counsel's argument is moot because as recognized by counsel the examiner relies on the disclosure of Macquart to teach the use of a chromium oxide or nickel oxide overlying layer.

Counsel asserts that "Macquart clearly states that the protective layer 5 located over the Ag layer is metallic (i.e., not an oxide)." The examiner respectfully disagrees. Macquart discloses that the protective layer is "of a metallic nature" when initially deposited on the Ag reflective layer, but when subsequent "sputtering is carried out in the presence of O₂ so as to deposit an oxide... (the protective layer) is partially as seen as essential, oxidized" (column 6, lines 8-21). Macquart discloses that when a zinc oxide layer (6) is deposited over the protective

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layer (5) the protective layer is oxidized as a result of the sputtering of the zinc oxide layer in the presence of oxygen. Macquart discloses that the protective layers may be chromium or nickel when initially deposited on the Ag reflective layer (column 6, lines 8-14), therefore, Macquart discloses that the chromium or nickel layer becomes chromium oxide or nickel oxide upon the deposition of the zinc oxide layer (5).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Andrew T Piziali whose telephone number is (703) 306-0145. The examiner can normally be reached on Monday-Friday (8:00-4:30).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Deborah Jones can be reached on (703) 308-3822. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 306-5665.



atp
December 4, 2002

Andrew T Piziali
Examiner
Art Unit 1775


DEBORAH JONES

SUPERVISORY PATENT EXAMINER